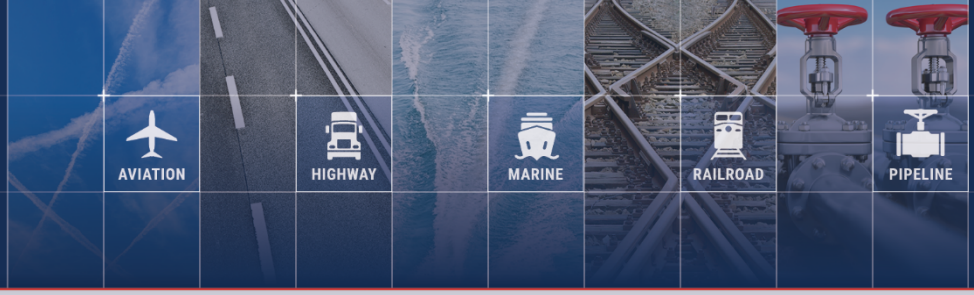

Aviation Investigation Final Report

Location:	Knox, Indiana	**Accident Number:**	CEN19LA225
Date & Time:	July 13, 2019, 19:24 Local	**Registration:**	N2863J
Aircraft:	Cessna T188	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The pilot was practicing agricultural application passes along the operator's airstrip. A witness reported that the pilot's initial passes were completed without incident, although the pilot "seemed to be slightly aggressive in the turns." After landing, the pilot mentioned turning at an airspeed of 60 mph, and the witness informed him to never fly below 80 mph. The pilot took off and completed three more practice passes. After the pilot's final pass, he executed a "very steep field exit" and held the airplane in a nose-up attitude longer than required to clear the obstacles. He entered a left 270° turn and, after rolling wings-level, the airplane entered an "extremely slow" climb before abruptly rolling into a steep left bank that continued until impact. The pilot reported that the did not recall any of the events leading to the accident.

A postaccident examination revealed damage to the forward fuselage, both wings and the empennage. The examination did not reveal any anomalies consistent with a preimpact failure or malfunction. It is likely that the pilot exceeded the airplane's critical angle of attack while maneuvering, which resulted in an aerodynamic stall at an altitude that precluded recovery.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's exceedance of the airplane's critical angle of attack, which resulted in an aerodynamic stall and loss of airplane control.

Findings

Aircraft	Angle of attack - Capability exceeded
Aircraft	Airspeed - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Maneuvering-low-alt flying	Aerodynamic stall/spin (Defining event)
Maneuvering-low-alt flying	Loss of control in flight
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On July 14, 2019, about 1924 central daylight time, a Cessna T188C airplane, N2863J, was substantially damaged when it impacted terrain near Knox, Indiana. The pilot sustained serious injuries. The airplane was registered to and operated by AAA Spraying Solutions, LLC dba Bluebird Ag, as a Title 14 *Code of Federal Regulations* Part 91 aerial application training flight. Visual meteorological conditions prevailed, and the flight was not operated on a flight plan. The local flight originated from the operator's airstrip about 1900.

The pilot reported that he did not have any memory of the events leading up to, or of any portion of, the accident flight. He had not completed any agricultural application work within the previous 2 years and was reestablishing his currency at the time of the accident.

The operator stated that the pilot was practicing by spraying water along the operator's airstrip. The pilot completed several takeoffs and landings, and then sprayed 40 gallons of water over the runway. After landing, the pilot commented that the airplane had gotten down to 60 mph in the turns. The pilot was informed that the minimum airspeed in turns was 80 mph. An additional 80 gallons of water were loaded onto the airplane for another practice flight. The pilot conducted a couple more passes over the runway and appeared to be returning for another pass, when the airplane pitched up to clear a group of trees before entering a left turn. The airplane appeared to get "very slow in the turn." The witness "heard the engine go to full power" as the left turn continued. The wings leveled momentarily before the airplane entered a second left turn that "just kept getting steeper." The airplane impacted the ground with a 60° to 70° bank angle.

A second witness, who was an agricultural application pilot and familiar with the accident airplane, reported that the initial passes with 40 gallons of water were completed without incident; although, the pilot "seemed to be slightly aggressive in the turns." After the pilot landed, the airplane was loaded with 80 gallons of water. While the airplane was being loaded, the pilot "mentioned something about turning at 60 mph indicated" airspeed. The witness stressed to the pilot his own comfort level of never flying below 80 mph indicated airspeed. The pilot took off and completed three more practice passes. His final pass was from west to east, and he executed a "very steep field exit." The pilot held the airplane in a nose up attitude longer than required to clear the obstacles. The pilot then executed a left 270° turn. The engine sounded as if it was making full power after the pilot rolled wings level. The pilot appeared to begin lowering the nose, but then seemed to begin pulling up before the airplane had regained sufficient energy. The airplane entered an "extremely slow climb;" wings level before abruptly rolling into a 60° plus left bank which continued until it descended behind trees immediately before impact. The witness

noted that he was close enough to see the control surfaces and they appeared to be responding to pilot inputs during that final turn.

A postaccident examination conducted by a Federal Aviation Administration inspector revealed damage to the forward fuselage, both wings and the empennage. The inspector did not report any anomalies consistent with a preimpact failure or malfunction.

The airplane owner's manual noted aerodynamic stall airspeeds of 73 mph at a 0° angle of bank (wings level) and 103 mph at a 60° angle of bank when operating at 4,400 lbs gross weight with wing flaps retracted. The manual added that the airplane stall characteristics are conventional, and the stall warning should sound 5 to 10 mph above the stall speed in all configurations.

Pilot Information

Certificate:	Commercial	**Age:**	38,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	March 25, 2019
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	March 1, 2019
Flight Time:	460 hours (Total, all aircraft), 165 hours (Total, this make and model), 3 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N2863J
Model/Series:	T188 C	**Aircraft Category:**	Airplane
Year of Manufacture:	1979	**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	T18803538T
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	June 27, 2019 Annual	**Certified Max Gross Wt.:**	4400 lbs
Time Since Last Inspection:	29 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	7871 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Not installed	**Engine Model/Series:**	TSIO-520T
Registered Owner:	AAA Spraying Solutions LLC	**Rated Power:**	310 Horsepower
Operator:	AAA Spraying Solutions LLC	**Operating Certificate(s) Held:**	Agricultural aircraft (137)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	VPZ,770 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	19:56 Local	**Direction from Accident Site:**	310°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	26°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Knox, IN (PVT)	**Type of Flight Plan Filed:**	None
Destination:	Knox, IN (PVT)	**Type of Clearance:**	None
Departure Time:	19:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Wheeler IG05	**Runway Surface Type:**	Grass/turf
Airport Elevation:	720 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:	26	**IFR Approach:**	None
Runway Length/Width:	2600 ft / 200 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	41.294166,-86.622497(est)

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	Kristian Kortokrax; FAA Flight Standards; Des Plaines, IL
Original Publish Date:	February 2, 2021
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99838